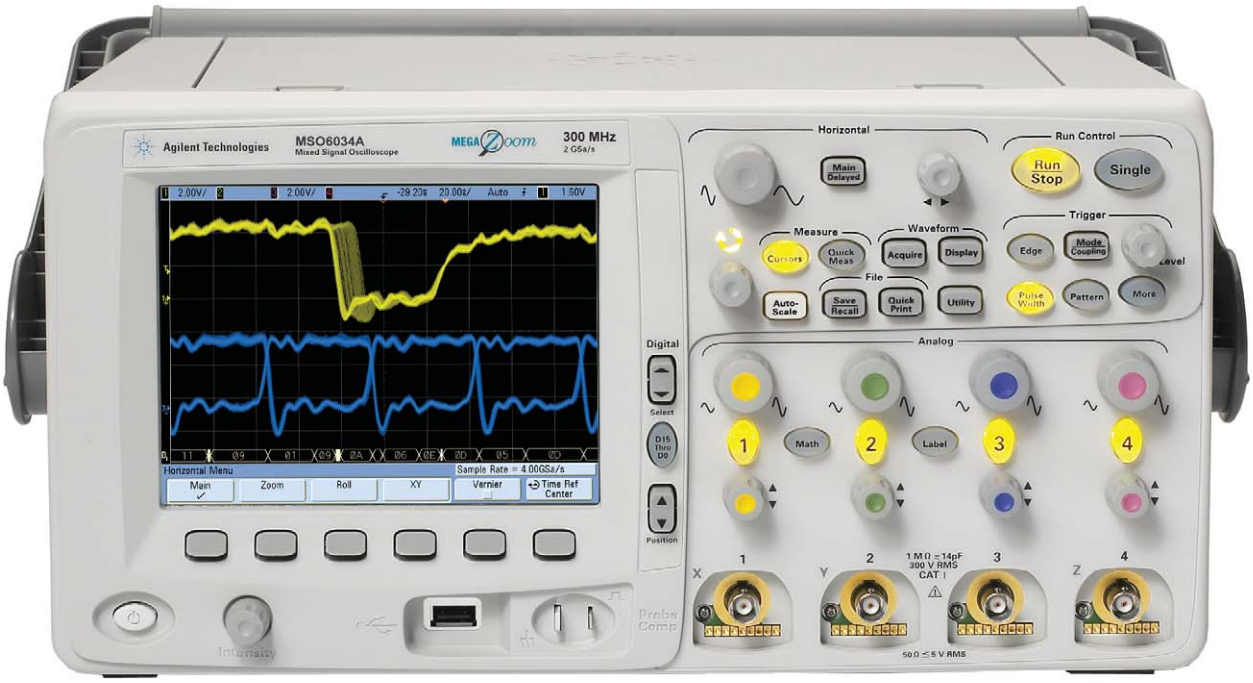
Agilent Technologies InfiniiVision 6000 Series Oscilloscopes

Data Sheet

Engineered for the best signal visibility



Agilent Technologies

If you haven't purchased an Agilent scope lately, why should you consider one now?

Agilent has been the fastest growing oscilloscope supplier since 1997 (source: Prima Data, 2007). Wonder why? Agilent engineers developed the InfiniiVision 6000 Series with advanced technology that will allow you to see more subtle signal detail and more infrequent events than any other scope on the market. See the InfiniiVision 6000 Series oscilloscope—the industry's best for signal viewing.

There is no better way to experience the superiority of the InfiniiVision 6000 Series scopes than to see it. Contact Agilent today to request an evaluation.

Or visit: www.agilent.com/find/mso6000

The InfiniiVision 6000 Series offers bandwidths up to 1 GHz. Each model, equipped with a 6.3" XGA LCD display, comes in a whisper-quiet package that weighs only 11 pounds.

Model	Bandwidth	Sample rate	Memory	Scope channels	Digital channels	Update rate
DSO6012A	100 MHz	2 GSa/s	8 Mpts	2		Up to 100,000 deep-memory waveforms per second, even with deep memory, digital channels and serial decode turned on.
DSO6014A				4		
MSO6012A				2	16	
MSO6014A				4		
DSO6032A	300 MHz	2 GSa/s	8 Mpts	2		
DSO6034A				4		
MSO6032A				2	16	
MSO6034A				4		
DSO6052A	500 MHz	4 GSa/s	8 Mpts	2		
DSO6054A				4		
MSO6052A				2	16	
MSO6054A				4		
DSO6102A	1 GHz	4 GSa/s	8 Mpts	2		
DSO6104A				4		
MSO6102A				2	16	
MSO6104A				4		

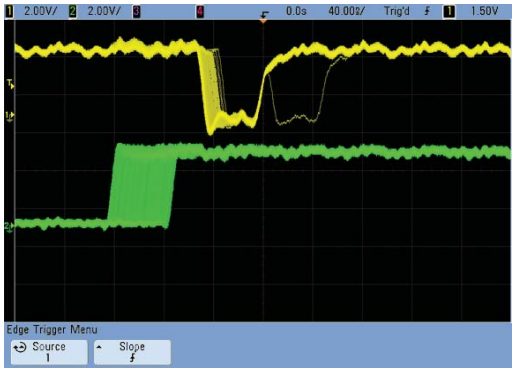
Choose from sixteen InfiniiVision 6000 Series models. Agilent provides an easy 5-minute DSO-to-MSO upgrade kit for previously purchased 6000 Series DSOs.

What gives the InfiniiVision 6000 Series the best signal visibility?

1. High resolution

Oscilloscopes are visual tools and high-resolution screens make the product better. High resolution displays have become increasingly important as general purpose scopes need to display digital and serial signals in addition to traditional scope channels.

View up to 20 channels simultaneously with serial protocol. See subtle signal detail with up to 256 levels of intensity.



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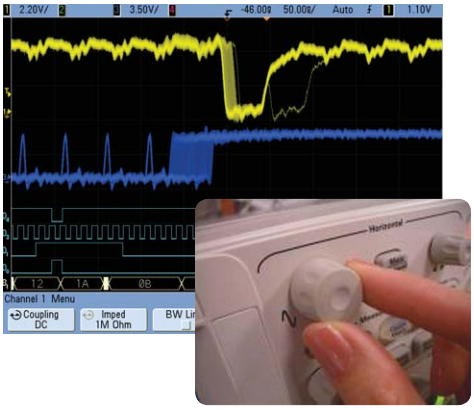
2. Fastest architecture

See a display more representative of the actual signals under test than with any other scope. The InfiniiVision 6000 Series shows jitter, infrequent events, and subtle signal detail that other scopes miss. Turn knobs and the instrument responds instantly and effortlessly. Need to also view digital channels? The instrument stays responsive. Decoding serial packets? Offering the industry's only hardware-accelerated serial bus decode, Agilent's InfiniiVision series delivers serial debug without compromising analog measurements.



MEGA Zoom III

InfiniiVision scopes incorporate acquisition memory, waveform processing, and display memory in an advanced 0.13 µ ASIC. This patented 3rd generation technology, known as Mega*Zoom* III, delivers up to 100,000 waveforms (acquisitions) per second with responsive deep memory always available.

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3. Insightful applications

Customize your general purpose scope. A wide range of application packages provide meaningful insight into your application-specific problems. (See pages 8-9 and 13-14 for more detail.)

Serial with hardware-accelerated decode

- I^2C, SPI
- CAN/LIN
- RS-232/UART
- FlexRay

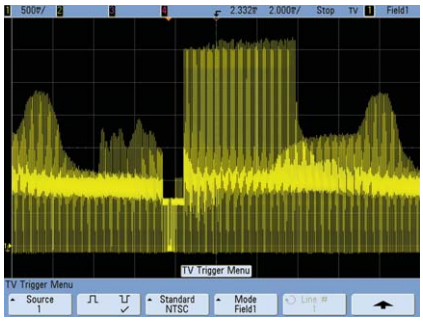
- Segmented memory
- DSO/MSO offline analysis
- Power measurement

- Vector signal analysis
- Core-assisted FPGA debug
- Secure environment

Battery option

Your design has analog, digital and serial signals ... shouldn't your scope?

Analog: Up to 1 GHz bandwidth and up to 4 GSa/s sample rate

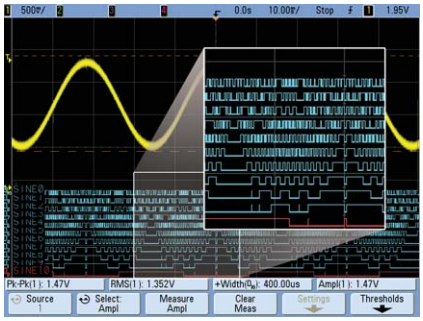


The InfiniiVision 6000 Series scope channels provide faster identification of your most elusive problems –

Revolutionary high-resolution display. Engineered with an XGA display and 256 levels of intensity grading, see a precise representation of the analog characteristics of the signals you're testing. Equipped with the industry's fastest uncomprimised update rate at 100,000 waveforms/sec update rate, you'll capture critical signal detail and see infrequent events that traditional scopes miss.

Mega*Zoom* III technology. Mega*Zoom* III responsive deep memory captures long, non-repeating signals and maintains high sample rates, allowing you to quickly zoom in on areas of interest. Sample rate and memory depth go hand-in-hand. Deep memory in oscilloscopes sustains a high sample rate over longer time spans.

Digital: 16 digital timing channels with mixed signal triggering



Capture a mix of analog or digital signals. Compare multiple cycles of digital signals with slower analog signals –

16 high-speed timing channels with up to 2 GSa/s deep memory. Use the timing channels to evaluate control signal relationship. Or capture and view data buses up to 16 bits wide. Trigger on and display individual signals or bus waveforms in hex or binary.

Mixed signal trigger.
Trigger across any combination of analog and digital signals simultaneously. See precise analog measurements timed with exact digital content, all in one box.

Applications for digital channels.
Designing with Altera or Xilinx FPGAs? Use the FPGA dynamic probe for rapid internal FPGA measurements. Using I^2C, SPI, or RS-232? Use the analog or digital signals from a 4-channe model to acquire and decode these serial buses.

Serial: Hardware-accelerated decode and trigger for I^2C, SPI, RS-232, CAN, LIN and FlexRay

Capture long streams of serial data and gain fast insight into your problems. Agilent 6000 Series oscilloscopes provide the best serial protocol capabilities in their class

Serial bus triggering and decoding.
Display responsive, on-screen decode of serial bus traffic. Isolate specific events with pinpoint accuracy. Show decode to validate serial bus activity in real time.

Quickly find infrequent errors.
Hardware-accelerated decoding increases your probability of capturing elusive events. Agilent oscilloscopes can help you catch that intermittent problem before it becomes an intermitten customer complaint or quality concern.

Easily capture enough serial data to see all of the details.
Use deep memory to capture serial data stream over a long period of time.

Other useful features

High resolution mode. Offers up to 12 bits of vertical resolution in real-time, single-shot mode. This is accomplished by serially filtering sequential data points and mapping the filtered results to the display when operating at time base settings greater than 10-µs/div.

Help is at your fingertips. An embedded help system – available in 11 languages – gives you quick answers if you don't understand a feature. Simply press and hold the corresponding front-panel key, and a screen pops up to explain its function.

Waveform math with FFT. Analysis functions include subtract, multiply, integrate, square root, and differentiate, as well as fast Fourier transforms (FFT).

Peak detect. 250 ps on 500-MHz and 1-GHz models, 500 ps on 350-MHz models and 1 ns on 100-MHz models helps you find narrow glitches.

AutoProbe interface. Automatically sets probe attenuation factors and provides power for selected active probes, including the award-winning 1130A 1.5-GHz InfiniiMax differential active probe and 1156A 1.5-GHz single-ended active probe systems.

5-digit hardware counter. Measures frequency up to the bandwidth of the scope.

Trig Out and Reference Clock In/Out. Provides an easy way to synchronize your scope to other instruments. Use the Trig Out port to connect your scope to a frequency counter for more accurate frequency measurements or to cross trigger other instruments.

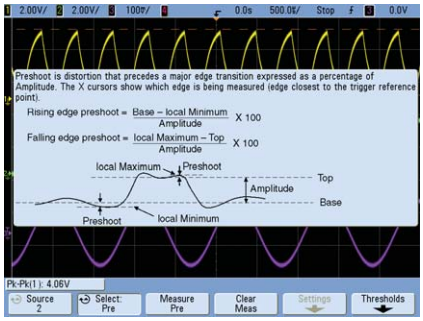
Autoscale. Displays all analog and digital active signals, and automatically sets the vertical, horizontal and trigger controls.

23 automatic measurements with QuickMeas. Pressing **[QuickMeas]** brings up the last four automated measurements selected. Cursors automatically track the most recently selected measurement.

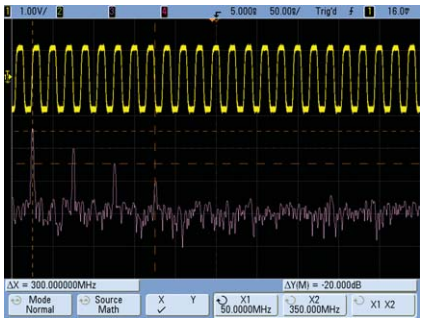
Analog HDTV/EDTV trigger. The 6000 Series comes standard with analog HDTV/EDTV triggering for standards like 1080i, 1080p, 720p and 480p as well as standard video triggering on any line within a field, all lines, all fields and odd or even fields for NTSC, SECAM, PAL and PAL-M video signals.

Bus mode display (on MSO models). Quick and easy read-out of hexadecimal or binary representation of logic signals.

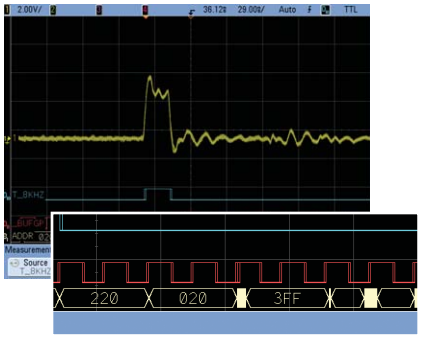
Easy software upgrades. System software is stored in flash ROM that can be upgraded from the scope's built-in USB port or LAN. You can find the latest system and IntuiLink software at: **www.agilent.com/find/mso6000sw**


Preshoot is distortion that precedes a major edge transition expressed as a percentage of Amplitude. The X cursors show which edge is being measured (edge closest to the trigger reference point).
Rising edge preshoot = Base – local Minimum / Amplitude X 100
Falling edge preshoot = local Maximum – Top / Amplitude X 100
local Maximum
Preshoot
Amplitude
Top
Base
Preshoot
local Minimum

Press and hold a key for instant help.



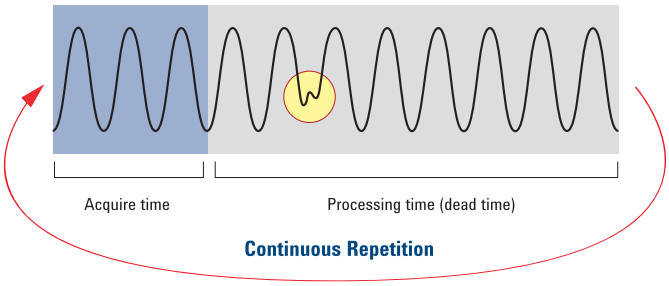
FFT allows you to view the spectral content of this clock signal.



Digital signals can be displayed individually or as overlayed bus values.

Why does a fast update rate matter?

While bandwidth, sample rate and memory depth are key criteria for deciding which scope to purchase, an equally important characteristic is update rate.



What is update rate?

Update rate is how many waveforms acquisitions per seconds you scope can acquire, process, and display. Oscilloscope "dead-time" is the time it takes for a scope to process and then display an acquired waveform before re-arming it's triggering for the next acquisition. For traditional scopes, this time is often orders of magnitude greater than acquisition time on fast time-per-division settings.

If a glitch occurs during the scope's dead-time, it won't be captured. The key to improving the probability of capturing a signal anomaly during the scope acquisition time is to minimize dead-time.

Oscilloscope vendors usually specify what their scope's "best-case" waveform update rates are. Some scope architectures suffer from factors that can seriously degrade the "best-case" update rates spec. Agilent's 6000 Series architecture delivers the world's fastest update rate when using:

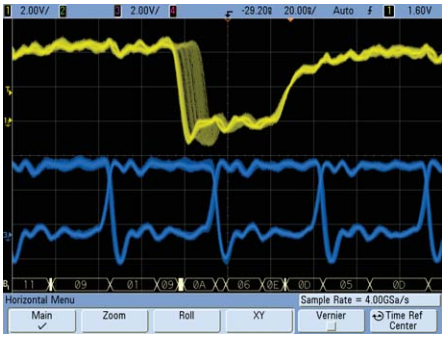
- Analog channels
- Deep memory
- Analog and digital
- Serial decode

Why is update rate important?

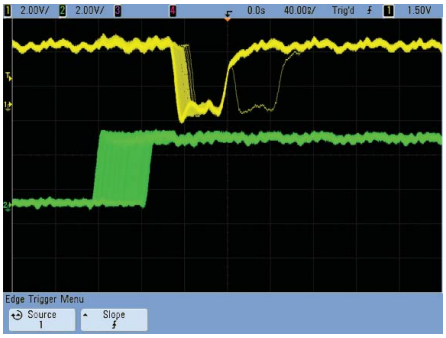
1. Responsiveness. If you rotate the timebase control, you expect the oscilloscope to respond immediately – not seconds later after the scope finishes processing data.
2. Signal detail. Fast waveform update rates improve the display quality of the waveform that you see on screen.
3. Certainty. Fast waveform update rates improve the scope's probability of capturing random and infrequent events.

Update rates directly affect a scope probability of capturing and displaying infrequent and random events. Slow update rates will cause a scope to miss subtle or infrequent signal details.

Improves instrument responsiveness



Improves scope display quality



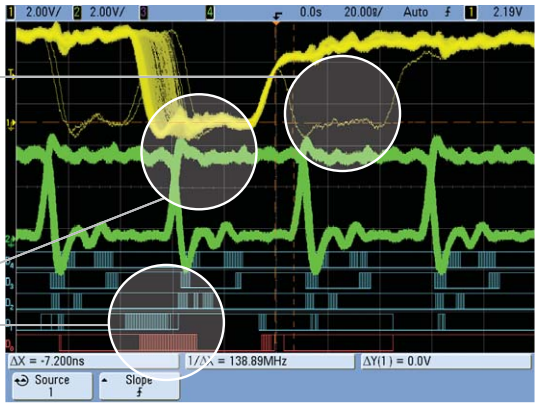
Improves probability of capturing infrequent events

How update rate affects signal visibility

Capturing random and infrequent events on an oscilloscope is all about statistical probabilities. The key to improving the probability of capturing a signal anomaly is to minimize dead-time and take more pictures of the signal in a given timeframe. Here is an example with Tek and Agilent scopes both connected to a target with a glitch that occurs 25 times per second.

Infrequent signal activity

Critical signal jitter



Tek MSO4104

- Product data sheet: 35,000 waveforms per second.
- Update rate = 18 waveforms per second with 10 Mpts and digital channels turned on. Resulting measurement shown.
- Probability of capturing the infrequent glitch = 0.09% after running for 10 seconds.
- Average time to capture just one glitch = 128 minutes.

Agilent MSO6104A

- Product data sheet: 100,000 waveforms per second.
- Update rate = 95,000 waveforms per second with auto memory and digital channels turned on. Resulting measurement shown.
- Probability of capturing the infrequent glitch = 99% after running for 10 seconds.
- Average time to capture just one glitch = 1.5 seconds.

	Memory*	Scope settings			Measured update rates		
	Tek	Timebase setting	Digital Channels	Serial Decode	TEK MSO4104A**	LeCroy WR 104Xi	Agilent MSO6104A
Initial setup	10 Kpts	20 ns/div	-	-	55,000	27	95,000
Change timebase	10 Kpts	10 ns/div	-	-	2,700	27	95,000
Add digital channels	10 Kpts	20 ns/div	On	-	125	27	95,000
Increase memory setting	10 Mpts	20 ns/div	On	-	35	27	95,000
Turn on serial decode	10 Mpts	20 ns/div	On	On	0.2	25	95,000

* Agilent and LeCroy memory depth selection was automatically selected. Memory depth = display window times sample rate with up to 8 Mpts for Agilent.
** Tek measurements taken with version 2.13 firmware.

Seeing subtle signal detail and infrequent events requires a scope with fast waveform update rates. Don't take a scope vendor's banner waveform update rate specification at face value. Test it yourself. It's actually pretty easy to characterize a scope's update rate. Run a moderately fast signal (e.g. 50 Mhz) into a scope channel. Measure the scope's average trigger output signal frequency. This is your scope's update rate for the specified timebase setting. Test the update rate of the scope under various setup conditions. Setup conditions that Agilent suggests varying include timebase range, memory depth, and number of channels, including analog, digital, as well as channels assigned for serial decoding.

Software applications

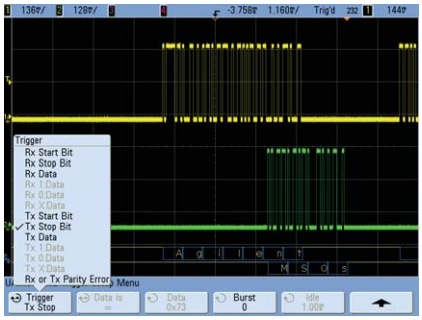
View on-screen serial decode of an I²C packet.

I²C/SPI serial trigger and decode (N5423A or Option LSS on new scope purchases)

This application displays real-time time-aligned decode of I²C and SPI serial buses. Hardware-accelerated decode means the scope stays responsive and fast.

This application requires a 4-channel DSO or 4-channel MSO and can use any combinatio of the scope or logic acquisition channels.

For more information:
www.agilent.com/find/I²C-SPI



Trigger on and decode RS-232/UART transmission.

RS-232/UART serial decode and trigger (N5457A or Option 232 on new scope purchases)

Does your design include RS-232 or another type of UART? This application eliminates the need to manually decode bus traffic. Using data captured on the scope or logic channels, the application lets you easily view the information sent over a RS-232 or other UART serial bus.

Display real-time time-aligned decode of transmit and receive lines. The application also enables triggering on RS-232/UART conditions.

This application requires a 4-channel DSO or 4-channel MSO and can use any combination of the scope or logic acquisition channels.

For more information:
www.agilent.com/find/RS-232

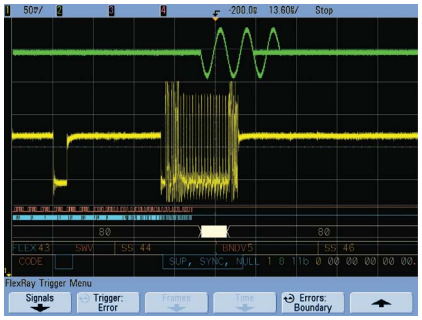
Trigger on and decode CAN serial packets.

CAN/LIN triggering and decode (N5424A or Option AMS on new scope purchases)

Trigger on and decode serially transmitted data based on CAN and LIN protocols. This application not only provides triggering on complex serial signals, but it also provides unique hardware-accelerated capabilities. Hardware-accelerated triggering and decode means the scope stays responsive and fast.

This application requires a 4-channel DSO or 4-channel MSO and can use any combination of scope or logic acquisition channels.

For more information: **www.agilent.com/find/CAN-LIN**



See mixed signal measurements in a FlexRay system using an MSO.

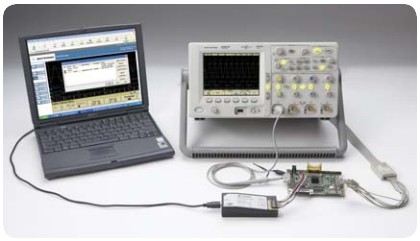
FlexRay triggering and decode (N5432A or Option FRS on new scope purchases)

FlexRay protocol is based on time-triggered and deterministic architecture. Agilent's FlexRay solution for the 6000 Series mixed signal oscilloscopes offers a robust set of FlexRay frame, slot, and error triggering, including the ability to trigger on specific FlexRay communications qualified on base-cycle and cycle-repetition. This solution combines an Agilent 6000 Series mixed signal oscilloscope (MSO) with an Agilent VPT 1000 vehicle protocol tester for FlexRay protocol analyzer.

This application requires a 4-channel MSO.

For more information: **www.agilent.com/find/flexray**

Software applications



Debug and validate your FPGA designs faster and more effectively with the FPGA dynamic probe and an Agilent MSO.

FPGA dynamic probe application (N5406A for Xilinx, N5434A for Altera)

Give your MSO internal FPGA visibility. Agilent's MSO FPGA dynamic probe provides internal FPGA visibility and quick instrument setup using an innovative core-assisted debug approach. Measurement tasks that previously took hours can be done in a few mouse clicks. In a few seconds, easily measure a different set of internal signals without changing your FPGA design.

This application works with all MSO models.

For more information:
www.agilent.com/find/6000-altera
www.agilent.com/find/6000-xilinx

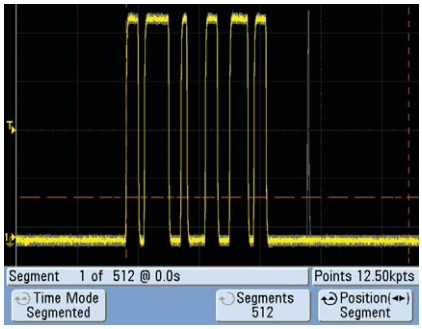
Expand the capability of your scope with 89601A vector analysis software.

Vector signal analysis software (89601A)

Expand the measurement capability of your scope with the 89601A vector signal analysis software. This advanced DSP based software takes the digitized signal data provided by the scope and provides FFT based spectrum analysis and wide bandwidth digital modulation analysis for wireless communication signals like WCDMA and cdma2000, and wireless networking signals like 802.11 WiFi and 802.16 WiMax™.

Take advantage of the super wide bandwidth of your scope to capture and evaluate radar signals.

For more information: **www.agilent.com/find/6000-vsa**



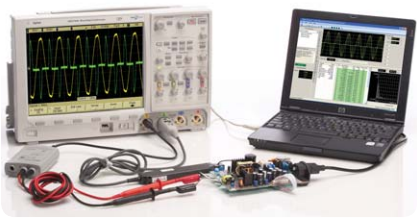
Use segmented memory to optimize available memory.

Segmented memory (N5454A or Option SGM on new scope purchases)

Segmented memory optimizes available memory for data streams that have long dead times between activity. The application excels at analyzing signal activity associated with laser pulses, serial buses, and bursty signals such as radar. View an overlay of all signal segments, including MSO channels and serial decode, while highlighting the current segment. Quickly move between segments to view signal detail associated with a specific segment.

This application works with all DSO and MSO models.

For more information: **www.agilent.com/find/segmented**



Use your scope to quickly make and analyze power measurements.

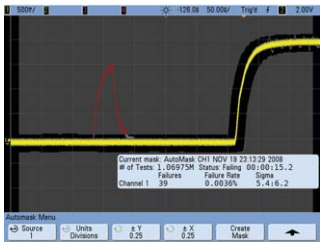
Power application (U1881A)

Need to make power measurements with your scope? Agilent's power application provides a full suite of power measurements that run on a PC connected to an InfiniiVision 6000 Series oscilloscope. Make more accurate power supply efficiency measurements by using an U1880A deskew fixture to deskew your voltage and current probes.

This application works with all DSO and MSO models.

For more information: **www.agilent.com/find/power-app**

Software applications and other accessories

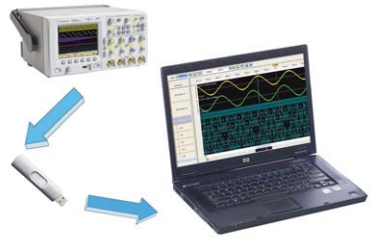


Mask testing uncovers an infrequent signal anomaly.

Mask testing (N5455A or Option LMT)

Agilent's mask test option (Option LMT or N5455A) for InfiniiVision Series oscilloscopes provides a fast and easy way to test your signals to specified standards, and uncover unexpected signal anomalies, such as glitches. Mask testing on other oscilloscopes is based on software-intensive processing technology, which tends to be slow. Agilent's InfiniiVision scopes can perform up to 100,000 real-time waveform pass/fail tests per second. This provides testing throughput significantly faster than other mask test solutions, making valid pass/fail statistics available almost instantly.

For more information: **www.agilent.com/find/masktest**



View and analyze previously acquired scope data on a PC-based offline tool.

Offline viewing and analysis (B4610A)

Need to view and analyze scope data away from your scope? Need to share measurement data with geographically dispersed team members? Save your scope data to a USB or network drive and import the data into a PC-based offline viewer. Pan and zoom. Use searching and filtering to gain insight on analog and digital buses. Email the data to team members who can use the same tool at their PCs.

For more information: **www.agilent.com/find/InfiniiVisionOffline**

Secure environment mode ensures nonvolatile memory is cleared on power off.

Secure environment mode (Option SEC or N5427A)

Option SEC – secure environment mode provides the highest level of security by ensuring internal nonvolatile memory is clear of all setup and trace settings in compliance with National Industrial Security Program Operation Manual (NISPOM) Chapter 8 requirements. When this option is installed, it will store setup and trace settings to internal volatile memory only.

Volatile memory will be cleared during the power off cycle of the instrument. So you can move the instrument out of a secure area with confidence.

For more information: *Option SEC Secure Environment Mode Option for Agilent 6000 Series Oscilloscopes Data Sheet*

The evaluation kit helps you discover the power of InfiniiVision 6000 Series scopes.

Evaluation kit (N2918A)

The evaluation kit includes a variety of signals that demonstrate Mega*Zoom* III technology with its fast deep memory, superior waveform update rate, high definition display and mixed analog, digital and serial abilities.

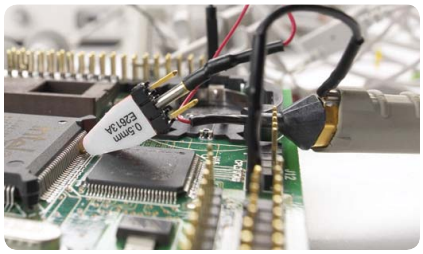
Using this scope evaluation kit along with the easy-to-follow user's guide, you can quickly become familiar with how to effectively operate an InfiniiVision 6000 Series scopes.

Battery power option (Option BAT – factory installed)

Agilent 6000 Series oscilloscopes provide an optional internal rechargeable lithium ion battery that will enable 2+ hours without line power. Specifically designed for applications where line power is not available or where you need to take your scope with you but you need more power than a handheld scopemeter provides. New oscilloscopes equipped with this option can also be operated off of the N5429A 12-V automotive adapter. The Agilent 6000 Series oscilloscopes offer the only high-performance scope with battery option on the market.

For more information: **www.agilent.com/find/6000_BAT**

Probes and accessories



Agilent offers a complete family of innovative passive and active probes for the InfiniiVision 6000 Series scopes to get your job done easily and accurately. Choosing the correct probe for your application will help to ensure you are acquiring the signals you expect. Below is a general guide on how to choose the type of probe. For the most up-to-date information about Agilent's accessories, please visit our Web site at **www.agilent.com/find/scope_probes**.

Probe type	Key characteristics	DSO601xA, MSO601xA	DSO603xA, MSO603xA DSO605xA, MSO605xA DSO610xA, MSO610xA
Passive probes: *most common type of probe, rugged and economical with bandwidth generally lower than 600 MHz*			
10070C	1:1 20 MHz with probe ID	Recommended*	Recommended
10073C	10:1 500 MHz with probe ID	Compatible*	Included
10074C	10:1 150 MHz with probe ID	Included*	Compatible
High voltage passive probe: *view up to 30 kVDC + peak AC voltage referenced to earth ground*			
10076A	100:1, 4 kV, 250 MHz probe with ID	Recommended	Recommended
N2771A	1000:1, 30 kV, 50 MHz probe	Recommended	Recommended
Single-ended active probes: *contains small, active amplifier and enables the probe input capacitance to be very low resulting in high input impedance on high frequencies. Least intrusive of all probes.*			
1156A	1.5 GHz AutoProbe interface	Incompatible*	Recommended
1144A	800 MHz (requires 1142A – power supply)	Incompatible	Recommended
1145A	750 MHz 2-ch (requires 1142A – power supply)	Incompatible	Recommended
Active differential probes: *use to look at signals that are referenced to each others instead of earth ground and to look at small signals in the presence of large DC offsets or other common mode signals such as power line noise.*			
1130A	1.5 GHz InfiniiMax amplifier with AutoProbe interface (requires one or more InfiniiMax probe head – E2675A, E2668A, E2669A)	Incompatible	Recommended
N2772A	20 MHz, 1.2 kVDC + peak AC max (requires N2773A power supply)	Recommended	Recommended
1141A	200 MHz, 200 VDC + peak AC max (requires 1142A power supply)	Compatible	Recommended
Current probes: *sense the AC or DC current flowing through a conductor and convert it to a voltage that can be viewed and measured on an oscilloscope. Compatible with 1 MΩ scope input.*			
1146A	100 kHz, 100 A, AC/DC	Recommended	Recommended
1147A	50 MHz, 30 A, AC/DC with AutoProbe interface	Incompatible	Recommended
N2780A	2 MHz, 500 A, AC/DC (use with N2779A power supply)	Recommended	Recommended
N2781A	10 MHz, 150 A, AC/DC (use with N2779A power supply)	Recommended	Recommended
N2782A	50 MHz, 30 A, AC/DC (use with N2779A power supply)	Recommended	Recommended
N2783A	100 MHz, 30 A, AC/DC (use with N2779A power supply)	Recommended	Recommended
MSO probes: *offer the best performance and access to the industry's broad range of logic analyzer probing accessories*			
01650-61607**	40-pin, 16-channel logic probe	Recommended with MSO6000 models	Recommended with MSO6000 models
54620-68701	Logic probe with 2x8 flying leads (includes 20 IC clips and five ground leads)	Recommended and included with MSO6000 models	Recommended and included with MSO6000 models

* **Recommended** is a suggestion from Agilent scope and probing experts that this probe works well with this scope.
Compatible indicates that the probe and scope will work together but that there are other choices that will work better.
Included means that this probe ships with this scope.
Incompatible is a warning that the probe will not work with the indicated scope.

** With the addition of 40-pin logic cable, the Agilent MSO accepts numerous logic analyzer accessories such as Mictor, Samtec, flying leads or soft touch connectorless probe.

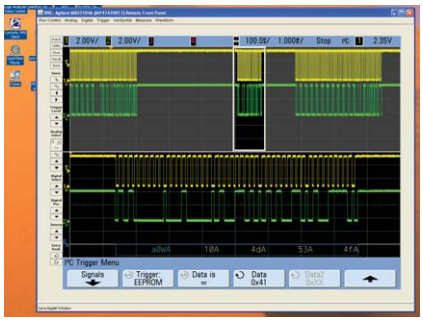
For more comprehensive information, refer to the *Agilent InfiniiVision Series Oscilloscopes Probes and Accessories* Data Sheet and Selection Guide (Agilent publication numbers 5968-8153EN/ENUS and 5989-6162EN).

Connectivity

The 6000 Series scopes come with the most comprehensive connectivity tools in their class.

LXI class C

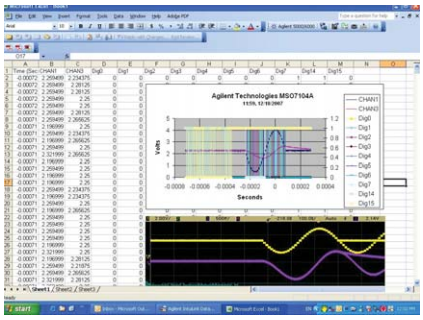
LAN eXtensions for Instrumentation (LXI) is a standards-based architecture for test systems. By specifying the interaction of system components, LXI enables fast and efficient test system creation and reconfiguration. The 6000 Series oscilloscopes follow specified LAN protocols and adhere to LXI requirements such as a built-in Web control server, IVI-COM driver, and easy-to-use SCPI commands. The standard Agilent I/O Library Suite makes it easy to configure and integrate instruments in your system.



Agilent Remote Front Panel running in a Web browser

IntuiLink toolbars and IntuiLink Data Capture

IntuiLink gives you a quick way to move oscilloscope screen shots and data into Microsoft® Word and Excel. These toolbars can be installed from www.agilent.com/find/intuilink.



Use IntuiLink to import scope screen shots and data into Microsoft Word and Excel.

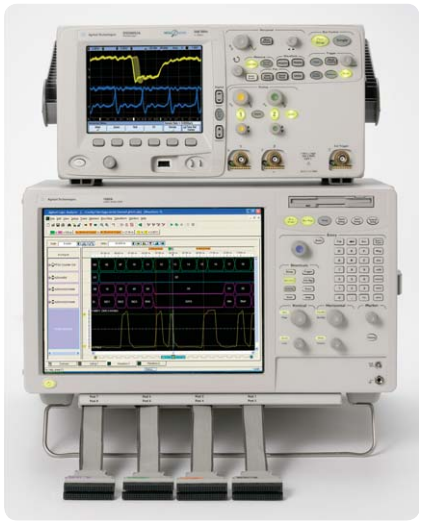
View Scope logic analyzer and oscilloscope correlation

View Scope enables simple and free time-correlated measurements between a 6000 Series oscilloscope and an Agilent 16900, 16800, 1690, or 1680 Series logic analyzer. Scope and logic waveforms are integrated into a single logic analyzer waveform display for easy viewing analysis – all with a simple point-to-point LAN connection. You can also cross-trigger the instruments, automatically de-skew the waveforms, and maintain marker tracking between the instruments.

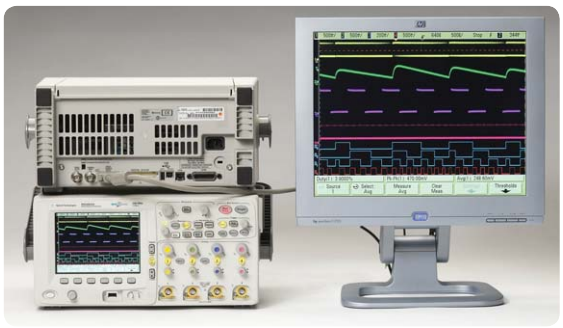
National Instrument drivers

InfiniiVision 6000 Series oscilloscopes are supported by LabVIEW plug-and-play and IVI-C drivers.

6000L Series, the most space efficient and affordable LXI Class C compliant oscilloscope.



Use ViewScope to time-correlate oscilloscope and logic analyzer measurements.



View 6000 Series signals on an external monitor using the always-on XGA video output.

Agilent InfiniiVision Portfolio

Agilent's InfiniiVision lineup includes 5000, 6000 and 7000 Series oscilloscopes. These share a number of advanced hardware and software technology blocks. Use the following selection guide to determine which best matches your specific needs.

Largest display, shallow depth

Optional battery, 100 MHz MSO

Ideal for ATE rackmount applications

Smallest form factor, lowest price

Bandwidth	7000 Series	6000A Series	6000L Series	5000 Series
100 MHz Bandwidth		●	●	●
300/350 MHz Bandwidth	●	●	●	●
500 MHz Bandwidth	●	●	●	●
1 GHz Bandwidth	●	●	●	
MSO Models	●	●	●	
GPIB Connectivity		●	●	●
Rackmount height	7U	5U	1U	5U
Battery option		●		
Display size	12.1″	6.3″		6.3″
Footprint (WxHxD)	17.9″x 10.9″x 6.8″	15.7″x 7.4″x 11.1″	17.1″x 1.7″x 10.6″	15.2″x 7.4″x 6.9″

Agilent's InfiniiVision oscilloscope portfolio offers:

- A variety of form factors to fit your environment
- Insightful application software
- Responsive controls and best signal visibility
- Responsive deep memory with Mega*Zoom* III

Agilent InfiniiVision 6000 Series oscilloscopes:

The fastest way to debug your analog, digital and serial designs

High-resolution color display with XGA resolution and 256 levels of intensity reveals subtle details that other scopes won't show you.

Built-in USB port makes it easy to save your work and update your system software quickly.

Intensity knob allows you to see the right level of waveform detail, just like an analog scope.

Free IntuiLink data capture PC software makes transferring waveform data or screen image to a PC fast and easy. Built-in web viewer via LAN allows for remote measurements and viewing.

Built-in help in eleven languages – Simply press and hold the front-panel key of interest for a few seconds, and a help screen pops up to explain its function.

An XGA video output port allows you to connect to a large external monitor.

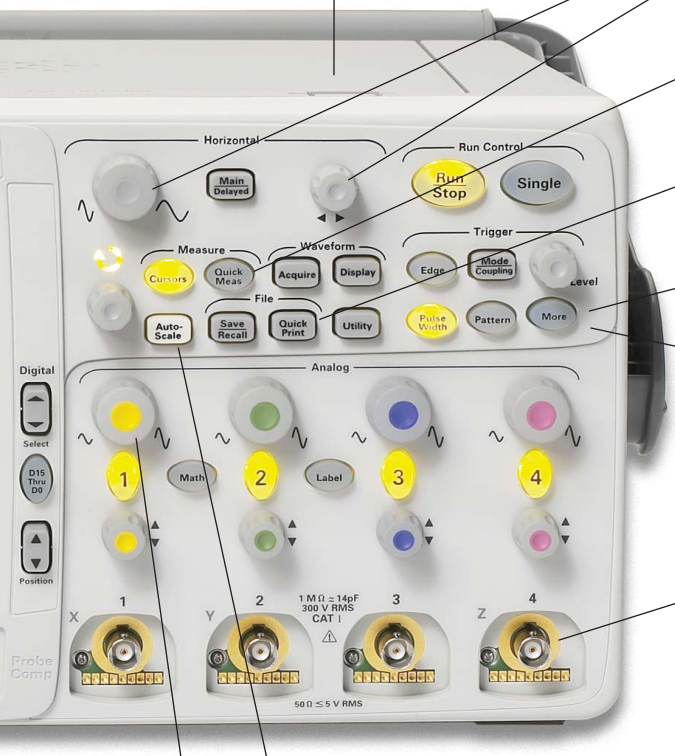
Standard USB, LAN and GPIB ports provide PC and printer connectivity.

Rear panel inputs/outputs

Trig Out port provides an easy way to synchronize your scope to other instruments.

Built-in 10-MHz reference in/out port lets you synchronize multiple measurement instruments in a system.

Built-in storage compartment allows you to store probes and power cord for easy access and transportation.



Quickly pan and zoom for analysis with Mega*Zoom* III's instant response and optimum resolution.

QuickMeas shows up to four automated measurements with the push of a button.

Save screen images to a connected USB storage device with automated file names.

Standard serial triggering includes I^2C, SPI, and USB (optional CAN/LIN, RS-232 and FlexRay advanced triggering and decode).

Standard analog HDTV/EDTV triggering supports triggering on 1080i, 1080p, 720p, 480p HDTV/EDTV standards.

AutoProbe interface automatically configures the attenuation ratio of the probe and provides probe power for Agilent's active probes (available on 300 MHz to 1 GHz models only).

Maximum sample rate and resolution is achieved on every measurement. The scope automatically adjusts memory depth as you use it, so you get maximum sample rate and resolution on every measurement. You don't even have to think about it.

Autoscale lets you quickly display any active signals, automatically setting the vertical, horizontal and trigger controls for the best display, while optimizing memory.

Dedicated front-panel controls make it easy to access the most common scope controls, including vertical and horizontal scaling.

InfiniiVision 6000 Series 2-channel model

Performance characteristics

Acquisition: scope channels

Sample rate	MSO/DSO601xA/603xA: 2 GSa/sec each channel MSO/DSO605xA/610xA: 4 GSa/sec half channel*, 2 GSa/sec each channel Equivalent-time sample rate: 400 GSa/s (when real-time mode is turned off)
Memory depth	2 channels/4 channels 8 Mpts/4 Mpts
Vertical resolution	8 bits
Peak detection	MSO/DSO601xA: 1-ns peak detect MSO/DSO603xA: 500-ps peak detect MSO/DSO605xA/610xA: 250-ps peak detect
Averaging	Selectable from 2, 4, 8, 16, 32, 64 ... to 65536
High resolution mode	Average mode with avg = 1 12 bits of resolution when ≥10 µs/div @ 4 GSa/s or ≥20-µs/div @ 2 GSa/s
Filter	Sinx/x interpolation (single shot BW = sample rate/4 or bandwidth of scope, whichever is less) with vectors on and in real-time mode

Acquisition: digital channels (MSO6000A or MSO-upgraded DSO6000A only)

Sample rate	2 GSa/sec one pod**, 1 GSa/sec each pod
Maximum input frequency	250 MHz
Memory depth	One pod/both pods (with scope channels turned off) 8 Mpts/4 Mpts One pod/both pods (with scope channels turned on) 2.5 Mpts/ 1.25 Mpts
Vertical resolution	1 bit
Glitch detection	2 ns (min pulse width)

* Half channel is when only one of channel 1 or 2 is turned on, and only channel 3 or 4 is turned on.

** A pod is a group of eight digital channels, either 0-7 or 8-15.

Performance characteristics (continued)

Vertical system: scope channels

Scope channels	MSO/DSO6xx2A: Ch 1 and 2 simultaneous acquisition MSO/DSO6xx4A: Ch 1, 2, 3 and 4 simultaneous acquisition
Bandwidth (–3dB)*	MSO/DSO601xA: DC to 100 MHz MSO/DSO603xA: DC to 300 MHz MSO/DSO605xA: DC to 500 MHz MSO/DSO610xA: DC to 1 GHz
AC coupled	MSO/DSO601xA: 3.5 Hz to 100 MHz MSO/DSO603xA: 3.5 Hz to 300 MHz MSO/DSO605xA: 3.5 Hz to 500 MHz MSO/DSO610xA: 3.5 Hz to 1 GHz
Calculated rise time (=0.35/bandwidth)	MSO/DSO601xA: 3.5 nsec MSO/DSO603xA: 1.17 nsec MSO/DSO605xA: 700 psec MSO/DSO610xA: 350 psec
Single-shot bandwidth	MSO/DSO601xA: 100 MHz MSO/DSO603xA: 300 MHz MSO/DSO605xA: 500 MHz MSO/DSO610xA: 1 GHz (in half-channel mode)
Range[1]	MSO/DSO601xA: 1 mV/div to 5 V/div (1 MΩ) MSO/DSO603xA and MSO/DSO605xA: 2 mV/div to 5 V/div (1 MΩ or 50 Ω) MSO/DSO610xA: 2 mV/div to 5 V/div (1 MΩ), 2 mV/div to 1 V/div (50 Ω)
Maximum input	CAT I 300 Vrms, 400 Vpk; transient overvoltage 1.6 kVpk CAT II 100 Vrms, 400 Vpk With 10073C or 10074C 10:1 probe: CAT I 500 Vpk, CAT II 400 Vpk
Offset range	±5 V on ranges <10 mV/div; ±20 V on ranges 10 mV/div to 200 mV/div; ±75 V on ranges >200 mV/div
Dynamic range	±8 div
Input impedance	MSO/DSO601xA: 1 MΩ ± 1% || 11 pF MSO/DSO603xA/605xA/610xA: 1 MΩ ± 1% || 14 pF or 50 Ω ± 1.5%, selectable
Coupling	AC, DC
BW limit	MSO/DSO601xA: 20 MHz selectable MSO/DSO603xA/605xA/610xA: 25 MHz selectable
Channel-to-channel isolation	DC to max bandwidth >40 dB
Standard probes	MSO/DSO601xA: 10:1 10074C shipped standard for each scope channel MSO/DSO603xA/605xA/610xA: 10:1 10073C shipped standard for each scope channel
Probe ID	MSO/DSO601xA: Auto probe sense MSO/DSO603xA/605xA/610xA: Auto probe sense and AutoProbe interface Agilent- and Tektronix-compatible passive probe sense

* Denotes warranted specifications, all others are typical. Specifications are valid after a 30-minute warm-up period and ±10 °C from firmware calibration temperature.

1 1 mV/div is a magnification of 2 mV/div setting for 100 MHz models and 2 mV/div is a magnification of 4 mV/div setting for 300 MHz to 1 GHz models. For vertical accuracy calculations, use full scale of 16 mV for 1 mV/div sensitivity setting and 32 mV for 2 mV/div sensitivity setting.

Performance characteristics (continued)

Vertical system: scope channels (continued)

ESD tolerance	±2 kV
Noise, RMS, input shorted	MSO/DSO601xA: 0.50% FS or 250 µV, whichever is greater MSO/DSO603xA: 0.50% FS or 300 µV, whichever is greater MSO/DSO605xA: 0.50% FS or 360 µV, whichever is greater MSO/DSO610xA: 0.65% FS or 360 µV, whichever is greater
DC vertical gain accuracy*[1]	±2.0% full scale
DC vertical offset accuracy	≤200 mV/div: ±0.1 div ±2.0 mV ±0.5% offset value; >200 mV/div: ±0.1 div ±2.0 mV ±1.5% offset value
Single cursor accuracy[1]	±{DC vertical gain accuracy + DC vertical offset accuracy + 0.2% full scale (~1/2 LSB)} *Example:* for 50 mV signal, scope set to 10 mV/div (80 mV full scale), 5 mV offset, accuracy = ±{2.0% (80 mV) + 0.1 (10 mV) + 2.0 mV + 0.5% (5 mV) + 0.2% (80 mV)} = ± 4.785 mV
Dual cursor accuracy*[1]	±{DC vertical gain accuracy + 0.4% full scale (~1 LSB)} *Example:* for 50 mV signal, scope set to 10 mV/div (80 mV full scale), 5 mV offset, accuracy = ±{2.0% (80 mV) + 0.4% (80 mV)} = ±1.92 mV

* Denotes warranted specifications, all others are typical. Specifications are valid after a 30-minute warm-up period and ±10 °C from firmware calibration temperature.

1 1 mV/div is a magnification of 2 mV/div setting for 100 MHz models and 2 mV/div is a magnification of 4 mV/div setting for 300 MHz to 1 GHz models. For vertical accuracy calculations, use full scale of 16 mV for 1 mV/div sensitivity setting and 32 mV for 2 mV/div sensitivity setting.

Vertical system: digital channels (MSO6000A or MSO-upgraded DSO6000A only)

Number of channels	16 logic timing channels – labeled D15 - D0
Threshold groupings	Pod 1: D7 - D0 Pod 2: D15 - D8
Threshold selections	TTL, CMOS, ECL and user-definable (selectable by pod)
User-defined threshold range	±8.0 V in 10 mV increments
Maximum input voltage	±40 V peak CAT I; transient overvoltage 800 Vpk
Threshold accuracy*	±(100 mV + 3% of threshold setting)
Input dynamic range	±10 V about threshold
Minimum input voltage swing	500 mV peak-to-peak
Input capacitance	~8 pF
Input resistance	100 kΩ ±2% at probe tip
Channel-to-channel skew	2 ns typical, 3 ns maximum

* Denotes warranted specifications, all others are typical. Specifications are valid after a 30-minute warm-up period and ±10 °C from firmware calibration temperature.

Performance characteristics (continued)

Horizontal

Range	MSO/DSO601xA: 5 nsec/div to 50 sec/div MSO/DSO603xA: 2 nsec/div to 50 sec/div MSO/DSO605xA: 1 nsec/div to 50 sec/div MSO/DSO610xA: 500 psec/div to 50 sec/div
Resolution	2.5 psec
Time scale accuracy*	≤ ± (15 + 2*(instrument age in years)) ppm
Vernier	1-2-5 increments when off, ~25 minor increments between major settings when on
Delay range	Pre-trigger (negative delay): Greater of 1 screen width or 1 ms (with 8 Mpts memory option) Post-trigger (positive delay): 1 s to 500 seconds
Analog delta-t accuracy	Same channel: ±0.0015% reading ±0.1% screen width ±20 ps Channel-to-channel: ±0.0015% reading ±0.1% screen width ±40 ps *Same channel example (MSO/DSO605xA):* For signal with pulse width of 10 µs, scope set to 5 µs/div (50 µs screen width), delta-t accuracy = ±{0.0015% (10 µs) + 0.1% (50 µs) + 20 ps} = 50.17 ns
Logic delta-t accuracy	Same channel: ±0.005% reading ±0.1% screen width ±(1 logic sample period, 1 ns) Channel-to-channel: ±0.005% reading ±0.1% screen width ±(1 logic sample period) ±chan-to-chan skew *Same channel example:* For signal with pulse width of 10 µs, scope set to 5 µs/div (50 µs screen width), delta-t accuracy = ±{0.005% (10 µs) + 0.1% (50 µs) + 1 ns} = 51.5 ns
Modes	Main, delayed, roll, XY
XY	Bandwidth: Max bandwidth Phase error @ 1 MHz: <0.5 degrees Z Blanking: 1.4 V blanks trace (use external trigger on MSO/DSO6xx2A, channel 4 on MSO/DSO6xx4A)
Reference positions	Left, center, right
Segmented memory rearm time	8 µs (minimum time between trigger events)

Trigger system

Sources	MSO6xx2A: Ch 1, 2, line, ext, D15 - D0 DSO6xx2A: Ch 1, 2, line, ext MSO6xx4A: Ch 1, 2, 3, 4, line, ext, D15 - D0 DSO6xx4A: Ch 1, 2, 3, 4, line, ext
Modes	Auto, Normal (triggered), single
Holdoff time	~60 ns to 10 seconds
Trigger jitter	15 ps rms

* Denotes warranted specifications for units manufactured after January 1, 2008. Specifications are valid after a 30 minute warm-up period and within 10 °C of firmware calibration procedure.

Performance characteristics (continued)

Trigger system (continued)

Selections		Edge, pulse width, pattern, TV, duration, sequence, CAN, LIN, FlexRay, USB, I^2C, SPI, RS-232, Nth edge burst
	Edge	Trigger on a rising, falling, alternating or either edge of any source
	Pattern	Trigger at the beginning of a pattern of high, low, and don't care levels and/or a rising or falling edge established across any of the analog and digital channels, but only after a pattern has stabilized for a minimum of 2 nsec. The scope channel's high or low level is defined by that channel's trigger level. The logic channel's trigger level is defined by the threshold for the pod, 0 - 7 or 8 - 15.
	Pulse width	Trigger when a positive- or negative-going pulse is less than, greater than, or within a specified range on any of the source channels. Minimum pulse width setting: 5 ns (MSO/DSO601xA/603xA scope channels) 2 ns (MSO/DSO605xA/610xA scope channels) 2 ns (logic channels on MSO6000A or MSO-upgraded DSO6000A) Maximum pulse width setting: 10 s
	TV	Trigger using any scope channel on most analog progressive and interlaced video standards including HDTV/EDTV, NTSC, PAL, PAL-M or SECAM broadcast standards. Select either positive or negative sync pulse polarity. Modes supported include Field 1, Field 2, all fields, all lines, or any line within a field. TV trigger sensitivity: 0.5 division of sync signal. Trigger holdoff time can be adjusted in half field increments.
	Sequence	Arm on event A, trigger on event B, with option to reset on event C or time delay.
	CAN	Trigger on CAN (Controller Area Network) version 2.0A and 2.0B signals. Trigger on the start of frame (SOF) bit (standard). N5424A option supports triggering on remote frame ID (RTR), data frame ID (~RTR), remote or data frame ID, data frame ID and data, error frame, all errors, acknowledge error and overload frame.
	LIN	Trigger on LIN (Local Interconnect Network) sync break at beginning of message frame (standard). N5424A option supports triggering on frame ID.
	FlexRay	N5432A option supports trigger on FlexRay frame ID or time slot or specific error condition, along with cycle-base and repetition-cycle filtering.
	USB	Trigger on USB (Universal Serial Bus) start of packet, end of packet, reset complete, enter suspend, or exit suspend on the differential USB data lines. USB low speed and full speed are supported.
	I^2C	Trigger on I^2C (Inter-IC bus) serial protocol at a start/stop condition or user defined frame with address and/or data values. Also trigger on missing acknowledge, address with no acq, restart, EEPROM read, and 10-bit write.
	SPI	Trigger on SPI (Serial Protocol Interface) data pattern during a specific framing period. Supports positive and negative Chip Select framing as well as clock Idle framing and user-specified number of bits per frame.
	RS-232/UART	This application eliminates the need to manually decode bus traffic. Using data captured on the scope or digital channels, the application provides the ability to easily view the information sent over a RS-232 serial bus. Display real-time time-aligned decode of transmit and receive lines. This application also enables triggering on RS-232/UART conditions.
	Duration	Trigger on a multi-channel pattern whose time duration is less than a value, greater than a value, greater than a time value with a timeout, or inside or outside of a set of time values. Minimum duration setting: 2 ns Maximum duration setting: 10 s
	Nth edge burst	Trigger on the Nth edge of a burst that occurs after an idle time that you specify. Max edge count: 65,536.

Performance characteristics (continued)

Trigger system (continued)

Autoscale	Finds and displays all active scope and logic (for MSO6000A series MSO) channels, sets edge trigger mode on highest-numbered channel, sets vertical sensitivity on scope channels and thresholds on logic channels, time base to display ~1.8 periods. Requires minimum voltage >10 mVpp, 0.5% duty cycle and minimum frequency >50 Hz.

Scope channel triggering

Range (internal)	±6 div from center screen
Sensitivity*	<10 mV/div: greater of 1 div or 5 mV; ≥10 mV/div: 0.6 div
Coupling	AC (~3.5 Hz on MSO/DSO601xA, ~10 Hz on MSO/DSO603xA/605xA/610xA), DC, noise reject, HF reject and LF reject (~50 kHz)

Digital (D15 - D0) channel triggering (MSO6000A or MSO-upgraded DSO6000A only)

Threshold range (user defined)	±8.0 V in 10 mV increments
Threshold accuracy	±(100 mV + 3% of threshold setting)
Predefined thresholds	TTL = 1.4 V, CMOS = 2.5 V, ECL = –1.3 V

External (EXT) triggering	**MSO/DSO6xx2A (2-/2+16-ch models)**	**MSO/DSO6xx4A (4-/4+16-ch models)**
Input impedance	MSO/DSO6012A: 1 MΩ ± 3% || 11 pF or 50 Ω MSO/DSO6032A/6052A/6102A: 1 MΩ ± 3% || 14 pF or 50 Ω	MSO/DSO6014A: 1.015 kΩ ±5% MSO/DSO6034A/6054A/6104A: 2.14 kΩ ±5%
Maximum input	CAT I 300 Vrms, 400 Vpk, CAT II 100 Vrms, 400 Vpk With 10073C 10:1 probe: CAT I 500 Vpk, CAT II 400 Vpk 5 Vrms with 50-Ω input	±15 V
Range	DC coupling: trigger level ±1 V and ±8 V	±5 V
Sensitivity	For ±1 V range setting: DC to 100 MHz, 100 mV; MSO/DSO6032A/6052A/6102A: >100 MHz to bandwidth of oscilloscope: 200 mV For ±8 V range setting: DC to 100 MHz, 250 mV; MSO/DSO6032A/6052A/6102A: >100 MHz to bandwidth of oscilloscope: 500 mV	MSO/DSO6014A: DC to 100 MHz: 500 mV MSO/DSO6034A/6054A/6104A: DC to 500 MHz: 500 mV
Coupling	AC (~3.5 Hz), DC, noise reject, HF reject and LF reject (~50 kHz)	
Probe ID	MSO/DSO601xA: Auto probe sense MSO/DSO603xA/605xA/610xA: Auto probe sense and AutoProbe interface Agilent- and Tektronix-compatible passive probe sense	

* Denotes warranted specifications, all others are typical. Specifications are valid after a 30-minute warm-up period and ±10 °C from firmware calibration temperature.

Performance characteristics (continued)

Display system

Display	6.3-inch (161 mm) diagonal color TFT LCD
Throughput of scope channels	Up to 100,000 waveforms/sec in real-time mode
Resolution	XGA – 768 vertical by 1024 horizontal points (screen area); 640 vertical by 1000 horizontal points (waveform area) 256 levels of intensity scale
Controls	Waveform intensity on front panel. Vectors on/off; infinite persistence on/off, 8 x 10 grid with intensity control
Built-in help system	Key-specific help displayed by pressing and holding key or softkey of interest. Language support for 11 languages including English, German, French, Russian, Japanese, Traditional Chinese, Simplified Chinese, Korean, Spanish, Portuguese and Italian.
Real-time clock	Time and date (user adjustable)

Measurement features

Automatic measurements	Measurements are continuously updated. Cursors track last selected measurement. Up to four measurements can be displayed on screen at any one time.
Voltage (scope channels only)	Peak-to-peak, maximum, minimum, average, amplitude, top, base, overshoot, preshoot, RMS, standard deviation (AC RMS), Ratio (dB)
Time	Frequency, period, + width, – width and duty cycle on any channel. Rise time, fall time, X at max Y (time at max volts), X at min Y (time at min volts), delay, and phase on scope channels only.
Counter	Built-in 5-digit frequency counter on any channel. Counts up to the scope's bandwidth (1 GHz max). The counter resolution can be increased to 8 digits with an external 10-MHz reference.
Threshold definition	Variable by percent and absolute value; 10%, 50%, 90% default for time measurements
Cursors	Manually or automatically placed readout of horizontal (X, ΔX, 1/ΔX) and vertical (Y, ΔY). Tracking Cursors provides an additional mode for cursor positioning beyond the current manual method. When cursor tracking is enabled, changing a cursor's x-axis position results in the y-axis cursor tracking the corresponding y-axis (voltage, current, etc.) value. Additionally logic or scope channels can be displayed as binary or hex values.
Waveform math	f (g(t)) g(t): { 1, 2, 3, 4, 1-2, 1+2, 1x2, 3-4, 3+4, 3x4} f(t): { 1-2, 1+2, 1x2, 3-4, 3+4, 3x4, FFT(g(t)), differentiate d/dt g(t), integrate $\int$ g(t) dt, square root $\sqrt{}$g(t) } Where 1,2,3,4 represent analog input channels 1, 2, 3, and 4 Note: Channels 3 and 4 only available on MSO/DSO6xx4A models
Measurement statistics	Statistical data for enabled measurements such as mean, min, max, standard deviation and count

Performance characteristics (continued)

Storage

Save/recall (non-volatile)	10 setups and traces can be saved and recalled internally. Optional secure environment mode ensures setups and traces are stored to internal volatile memory so data is erased when power is removed. Compliant to NISPOM Chapter 8 requirements.
Storage type and format	USB 1.1 host ports on front and rear panels Image formats: BMP (8-bit), BMP (24-bit), PNG (24-bit) Data formats: X and Y (time/voltage) values in CSV format, ASCII XY and binary format Trace/setup formats: Recalled

FFT

Points	Fixed at 1000 points
Source of FFT	1, 2, 1+2, 1-2, 1x2, MSO/DSO6xx4A: 3, 4, 3+4, 3-4, 3x4; where 1, 2, 3, 4 represent the analog channel inputs 1, 2, 3, and 4
Window	Rectangular, flattop, hanning, Blackman Harris
Noise floor	–50 to –90 dB depending on averaging
Amplitude	Display in dBV, dBm at 50 Ω
Frequency resolution	0.05/time per div
Maximum frequency	50/time per div

I/O

Standard ports	USB 2.0 high speed device, two USB 1.1 host ports, 10/100-BaseT LAN, IEEE488.2 GPIB, XGA video output
Max transfer rate	IEEE488.2 GPIB: 500 kbytes/sec USB (USBTMC-USB488): 3.5 Mbytes/sec 100 Mbps LAN (TCP/IP): 1 Mbytes/sec
Supported printers via USB	For a list of currently supported printers visit **www.agilent.com/find/InfiniiVision-printers**

General characteristics

Physical size	35.4 cm wide x 18.8 cm high x 28.2 cm deep (without handle) 39.9 cm wide x 18.8 cm high x 28.2 cm deep (with handle)
Weight	Net: 4.9 kgs (10.8 lbs) Shipping: 9.4 kgs (20.7 lbs)
Probe comp output	Frequency ~1.2 kHz; Amplitude ~2.5 V

Performance characteristics (continued)

General characteristics (continued)

Trigger out	When Triggers is selected (delay ~17 ns) 0 to 5 V into high impedance 0 to 2.5 V into 50 Ω When Source Frequency or Source Frequency/8* is selected 0 to 580 mV into high impedance 0 to 290 mV into 50 Ω Max frequency output: 350 MHz (in source frequency mode when terminated in 50 Ω) 125 MHz (in source frequency/8 mode when terminated in 50 Ω)
10 MHz ref in/out	TTL out, 180 mV to 1 V amplitude with 0 to 2 V offset
Kensington lock	Connection on rear panel for security

Power requirements

Line voltage range	100-120 V, 50/60/400 Hz; 100-240V, 50/60 Hz auto ranging
Line frequency	50/60 Hz, 100-240 VAC; 400 Hz, 100-120 VAC
Power usage	120 W max
Battery option – BAT	2+ hours between charges, battery-low indicator at 20% Battery capacity after repeated charging: 80% after 300 cycles Non-operating temperature: –20 °C to 60 °C Operating temperature: 0 °C to 50 °C Power consumption is 67-75 Watts with optional N5429A DC Power adapter

Environmental characteristics

Ambient temperature	Operating 0 °C to +55 °C; non-operating –40 °C to +70 °C
Humidity	Operating 95% RH at 40 °C for 24 hr; non-operating 90% RH at 65 °C for 24 hr
Altitude	Operating to 4,570 m (15,000 ft); non-operating to 15,244 m (50,000 ft)
Vibration	Agilent class B1 and MIL-PRF-28800F; class 3 random
Shock	Agilent class B1 and MIL-PRF-28800F; class 3 random; (operating 30g, 1/2 sine, 11 ms duration, 3 shocks/axis along major axis, total of 18 shocks)
Pollution degree	Normally only dry non-conductive pollution occurs. Occasionally a temporary conductivity caused by condensation must be expected.
Indoor use	Rated for indoor use only

Other

Measurement categories	CAT I
	Regulatory information Safety IEC 61010-1:2001 / EN 61010-1:2001 Canada: CSA C22.2 No. 1010.1:1992 UL 61010B-1:2003
Supplementary information	The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC, and carries the CE-marking accordingly. The product was tested in a typical configuration with HP/Agilent test systems.

* Source Frequency/8 is supported on 300 MHz to 1 GHz 6000 Series only.

Ordering information

Model	Bandwidth	Maximum sample rate	Memory depth	Scope channels	Digital channels
DSO6012A	100 MHz	2 GSa/s	8 Mpts	2	
MSO6012A	100 MHz	2 GSa/s	8 Mpts	2	16
DSO6014A	100 MHz	2 GSa/s	8 Mpts	4	
MSO6014A	100 MHz	2 GSa/s	8 Mpts	4	16
DSO6032A	300 MHz	2 GSa/s	8 Mpts	2	
MSO6032A	300 MHz	2 GSa/s	8 Mpts	2	16
DSO6034A	300 MHz	2 GSa/s	8 Mpts	4	
MSO6034A	300 MHz	2 GSa/s	8 Mpts	4	16
DSO6052A	500 MHz	4 GSa/s	8 Mpts	2	
MSO6052A	500 MHz	4 GSa/s	8 Mpts	2	16
DSO6054A	500 MHz	4 GSa/s	8 Mpts	4	
MSO6054A	500 MHz	4 GSa/s	8 Mpts	4	16
DSO6102A	1 GHz	4 GSa/s	8 Mpts	2	
MSO6102A	1 GHz	4 GSa/s	8 Mpts	2	16
DSO6104A	1 GHz	4 GSa/s	8 Mpts	4	
MSO6104A	1 GHz	4 GSa/s	8 Mpts	4	16

Accessories included:

Model number	DSO60xxA	MSO60xxA
Standard 3-year warranty	•	•
10073C or 10074C 10:1 divider passive probe with readout per scope channel	•	•
16 channel flying lead set logic probe (two pods with eight channels each)		•
Built-in help language support for English, French, German, Russian, simplified Chinese, traditional Chinese, Korean, Spanish, Portuguese, Japanese and Italian	•	•
Interface language support GUI menus: English, simplified Chinese, traditional Chinese, Korean, Japanese	•	•
Choose one of ABA (printed users guide in English), ABJ (printed users guide in Japanese) or AB2 (printed users guide in simplified Chinese)	•	•
Documentation CDs/PDFs of Programmer's reference guide, User's guide and Service guide	•	•
Agilent I/O libraries suite 15.0	•	•
Localized power cord	•	•
Front panel cover	•	•

Note: IntuiLink Data Capture software available free on web at **www.agilent.com/find/intuilink**

Ordering information (continued)

Options

Product	Description
DSO to MSO upgrade*	N2914A* for DSO/MSO601xA, DSO/MSO603xA N2915A* for DSO/MSO605xA, DSO/MSO610xA
SEC	Secure Environment Mode - Provides compliance with National Industrial Security Program Operating Manual (NISPOM) Chapter 8 requirements (factory-installed option only for new purchase)
A6J	ANSI Z540 compliant calibration

*Includes a 54620-68701 logic cable kit, a label and an upgrade license to activate the MSO features. Installs in less than 5 minutes.

Serial data analysis applications

Option number – user installed	Option number – factory installed	Description
N5424A	AMS	CAN/LIN automotive triggering and decode (4 and 4+16 channel models only)
N5423A	LSS	I^2C/SPI serial decode option (for 4/4+16 channel models only)
N5432A	FRS	FlexRay automotive triggering and decode (4+16 channel models only and required VPT1000)
N5457A	232	RS-232/UART triggering and decode (4 and 4+16 channel models only)

User installed PC-assisted applications	Description
N5406A	FPGA dynamic probe for Xilinx (MSO models only)
N5434A	FPGA dynamic probe for Altera (MSO models only)
B4610A	Offline viewing and analysis of MSO/DSO data on a PC
U1881A	Power measurement and analysis application
E2690B	ASA's Oscilloscope tools

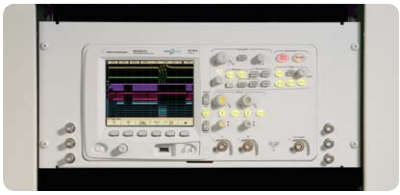
Other

Option number – user installed	Option number – factory installed	Description
N5454A	SGM	Segmented memory
	BAT	Re-chargeable battery option
N5455A	LMT	Mask limit testing
N5466A		InfiniiVision feature upgrade

Ordering information (continued)

Accessories

Options	Description
N2916B	Rackmount kit for 6000 Series oscilloscope
N2917B	Transit case with foam molding customized for InfiniiVision 6000 Series
N2918A	InfiniiVision evaluation kit
1180CZ	Testmobile scope cart
N2919A	Testmobile bracket for 1180CZ and 6000
10833A	GPIB cable, 1 m long



N2916B rackmount kit

Related Literature

Publication Title	Publication Type	Publication Number
Agilent Technologies Oscilloscope Family Brochure	Brochure	5989-7650EN
Agilent Technologies Probes and Accessories	Selection guide	5989-6162EN
Agilent Technologies InfiniiVision 5000, 6000 and 7000 Series Oscilloscope Probes and Accessories	Data sheet	5968-8153EN/EUS
N5433A I^2C and SPI Triggering and Hardware-Accelerated Decode Options for InfiniiVision 5000, 6000 and 7000 Series Oscilloscopes	Data sheet	5989-5126EN
CAN/LIN (N5424A) and FlexRay (N5432A) Options for Automotive Applications Using InfiniiVision 5000, 6000 and 7000 Series Oscilloscopes	Data sheet	5989-6220EN
RS-232/UART Triggering and Hardware-Accelerated Decode Options for InfiniiVision 5000, 6000 and 7000 Series Oscilloscopes	Data sheet	5989-7832EN
N5434A FPGA Dynamic Probe for Altera with InfiniiVision 6000 and 7000 Series MSOs	Data sheet	5989-5965EN
N5406A FPGA Dynamic Probe for Xilinx with InfiniiVision 6000 and 7000 Series MSOs	Data sheet	5989-1848EN
Segmented Memory Option for InfiniiVision 5000, 6000 and 7000 Series Oscilloscopes	Data sheet	5989-7833EN
Offline Viewing and Analysis for InfiniiVision 5000, 6000 and 7000 Series Oscilloscopes	Data sheet	5989-7834EN
Power Application for InfiniiVision 6000 and 7000 Series Oscilloscopes	Data sheet	5989-7835EN
Agilent 81150A Pulse Function Arbitrary Noise Generator	Data sheet	5989-6433EN
Agilent 33220A 20 MHz Function/Arbitrary Waveform Generator	Data sheet	5988-8544EN
Agilent 16900 Series Logic Analysis Mainframes	Data sheet	5989-0421EN
Agilent 16800 Series Portable Logic Analyzers	Data sheet	5989-5063EN
VSA for InfiniiVision 5000, 6000 and 7000 Series Oscilloscopes	Application note	5989-1679EN
N5455A Mask/Waveform Limit testing for InfiniiVision oscilloscopes	Data sheet	5990-3269EN
Testing Waveforms to a Six Sigma Standard Using Hardware-Accelerated Mask Testing	Application note	5990-3200EN

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